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ABSTRACT

This article examines issues that were critical for eight preservice teachers learning to teach mathematics and social studies in the context of reform-minded methods classes. The issues include: (1) the impact of their prior knowledge and experience in the development of content-specific pedagogical knowledge; (2) their conceptions of mathematics and social studies and of how students learn these subjects; (3) the impact of these conceptions on their plans for teaching; and (4) the ways in which issues of control undercut the decisions these preservice teachers made. Analysis of interview data revealed that the participants' descriptions of their own experiences in learning mathematics were focused on difficulties and successes, whereas in social studies these descriptions focused on affect, ranging from being bored to being greatly interested. Their conceptions of how the general population learns mathematics centered on natural ability and different types of learners, whereas in social studies these ideas were not applicable. Participants saw mathematics as identifiable and definable and social studies as more obscure. For the participants, the dominant issue in mathematics was "how do I get kids to learn mathematics"; in social studies the dominant issue was "what do I teach kids?". One preservice teacher's case is explored in depth. (Contains one table with highlights of participants' salient characteristics and background information and 19 references.) (ND)

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PRESERVICE TEACHER PLANNING:

A STUDY OF THE JOURNEY FROM LEARNER TO TEACHER IN MATHEMATICS AND SOCIAL STUDIES

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Abstract

This article examines issues that were critical for eight preservice teachers learning to teach mathematics and social studies in the context of reform-minded methods classes. The issues include: (1) the impact of their prior knowledge and experience in the development of content-specific pedagogical knowledge, (2) their conceptions of mathematics and social studies, and of how students learn these subjects, (3) the impact that these conceptions on their plans for teaching, and (4) and the way in which issues of control undercut the decisions they made.

We are, once again, in the midst of a number of reform efforts aimed at improving the education of our children. One of the reasons for reform comes from a view of learners not as passive receivers of knowledge, but as active participants who construct knowledge for themselves and filter it through their existing knowledge. Along with this change in how we view the process of learning, there are proposed changes in the curriculum and instruction of particular subject areas. The development of "national standards"—describing what good curriculum and instruction should look like in the various content areas—is the mode of this particular reform.[1] In 1989 the National Council of Teachers of Mathematics (NCTM) published its Curriculum and Evaluation Standards for School Mathematics. Since then, similar documents have been, or are being created in many different content areas, including the Curriculum Standards for the Social Studies published by the National Council for the Social Studies (1994), and documents devoted to some of the individual disciplines that are encompassed by social studies (e.g., economics, history and civics).

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[1] These reform efforts are not the first national reform efforts, nor are they necessarily distinct from previous efforts. For example, in the introduction to the Curriculum and Evaluation Standards for School Mathematics (1989) there is an acknowledgment that this document should be viewed as an extension of previous writings of the mathematics education community such as the 1983 document What is Fundamental and What is Not from the Conference Board of the Mathematical Sciences (p.1).

These many "standards" documents have been created with the goal of improving the education of our children and our teachers, and like most reform efforts, are likely to conflict with traditional conceptions of the nature of the subjects and of teaching and learning in those areas. Thus, educational reform, by it's very nature, requires that teachers make a transformation—it requires that they reevaluate their pedagogical knowledge in light of the principles of that reform effort. If the reform is to be successful, teachers' conceptions of teaching and learning must be constructed, or reconstructed, into conceptions that are consistent with those principles.

Theoretical Framework

A Model of Teacher Knowledge

Shulman's (1987) theoretical model of the different domains of knowledge that a professional teacher draws upon in planning and carrying out instruction provided a starting point for this study. These domains of knowledge are general pedagogical knowledge, knowledge of curriculum, knowledge of learning, knowledge of educational philosophy and goals, content knowledge and pedagogical content knowledge. Particular emphasis is placed on pedagogical content knowledge as being the "category most likely to distinguish the understanding of the content specialist from that of the pedagogue" (p.8).

Acknowledged in passing, but often overlooked in research practice, is the fact that for the elementary school teacher, this model would have to include the domains of content knowledge and pedagogical content knowledge for each of the different subject areas. We know from research on teaching (Stodolsky, 1988), teacher knowledge (e.g., Grossman, 1990; Wilson & Wineburg, 1993; Hashweh, 1987), teacher conceptions (e.g. Thompson, 1984; Hollingsworth, 1989), teacher planning (e.g., McCutcheon, 1980), and learning to teach (e.g., Ball, 1988; Feiman-Nemser & Parker, 1990) that it is important to pay attention to the subject matter when studying teaching and teachers. In fact, McCutcheon's (1980) research on teacher planning and

Stodolsky's (1988) research on classroom practice reveal that teachers employ different types of instruction for different subjects. But we still know very little about how subject matter influences the ways elementary school teachers develop their knowledge for and practice of teaching.

The model used as a basis for this study took Shulman's analysis, focused on the construct of pedagogical content knowledge, and tuned the construct to consider the ways in which subject matter might influence its development. Mathematics and social studies served as contrasting subject matters, and knowledge of the subject and of how students learn the subject served as windows on the early development of pedagogical content knowledge.

The Development of Preservice Teachers' Conceptions

Preservice teachers have had many experiences as learners and teachers, as well as interactions with persons and cultures (e.g., the culture of schooling, the culture of society) that have influenced their interpretation of those experiences. Their experiences as learners (and thus as observers of teaching) include experiences from kindergarten to twelfth grade and through their professional education. They also have had non-school based experiences of teaching and learning. In addition, the actions and attitudes of significant others (e.g., family, friends, teachers, guidance counselors, etc.) may have influenced their knowledge of subject matter, learning and pedagogy.

These elements are not new, and have been researched by others (e.g., Lortie, 1975; Borko, Eisenhart, Brown, Underhill, Jones, and Agard, 1992). It is clear that preservice teachers' prior experiences are likely to have a profound impact on the development of their knowledge for teaching. In their discussion of research on the effects that over a decade of learning in classrooms and thereby observing teaching before college has on teachers, Brown and Borko (1992) conclude "the research suggests *unless* formal education can change these preexisting images, teachers will employ methods similar to the methods their own teachers used" (p.222, emphasis added).

Based on the results of a previous study (Grant, 1992), I focused on the influence of the participants' experiences in elementary and secondary schools, and their experiences in the teacher education program. These seem to have a strong impact on the development of knowledge for teaching. With respect to the teacher education program, the relevant content and methods courses seemed to be an especially important influence, whether these courses reinforced existing conceptions of teaching and learning or challenged them.

Research Questions

The following questions guided this investigation: (1) What are preservice teachers' conceptions[2] of how children learn mathematics and social studies? (2) What are preservice teachers' conceptions of mathematics and social studies? (3) What are the dominant issues for preservice teachers in planning to teach mathematics and social studies? (4) Given that the purpose of the methods classes was, in part, to encourage preservice teachers to teach in reform-minded ways, are there ways to account for preservice teachers' responses, both positive and negative?

Methodology

Participants and Setting

The participants were eight volunteers from the same section of an elementary mathematics methods class. The participants shared certain characteristics: they were White, approximately 20 years old, and were all from the broad subsection of the population referred to as middle class.

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[2] More often than not, I will use the term *conceptions* as described by Thompson (1992) to indicate "a more general mental structure, encompassing beliefs, meanings, concepts, rules, mental images, preferences and the like" (p. 130). I feel that this term reflects our increasing awareness of the complexities of the cognition and affect that teachers draw upon in the process of teaching.

The make-up of the volunteers generally reflected the makeup of the course from which they came with one notable exception: gender. The methods class had 3 men and 17 women, whereas, the volunteer group consisted of all 3 men, and only 5 women.

The participants were juniors or seniors at the University. During the semester the study was conducted, these students were taking a group of three methods courses called a "methods block." This "block" consisted of three content-based methods classes—mathematics, social studies and science—to which students were assigned as a group. As part of this experience, each student or pair of students were assigned to a cooperating classroom teacher. Throughout the semester the student(s) journeyed to this classroom to observe, and to complete various assignments for each of the methods classes. These assignments included conducting a problem solving experience in mathematics and a discussion in social studies. The semester culminated with an intensive field experience week—during which each student taught either math, science or social studies in their cooperating teachers' classrooms. Only those who requested to teach mathematics or social studies were considered for this study. Of the eight volunteers, four taught mathematics during the intensive field experience and four taught social studies.

The Methods Courses

Before taking the mathematics methods course, all elementary education majors at the University were required to take a sequence of two mathematics content courses designed specifically for them. In social studies there were no such courses; instead students were required to take three content courses from a selection of geography, history, and other social science courses at some point before graduation.

The mathematics and social studies methods courses were taught using a combination of small group work and lecture with whole class discussion. Both courses promoted reform methods of teaching and exposed students to many of the ideas of the reform movements. In the mathematics methods course, this was evident in the explicit ways in which the readings and the

class discussions were reflective of the NCTM *Standards* (1989). In social studies, many of the readings were multicultural in nature, written from the view of the oppressed, and class discussions focused on continually redefining and exploring the implications of the goal of responsible citizenship.

Data Collection and Analysis

The primary source of data consisted of seven semi-structured interviews with each of the eight methods students during the semester. These interviews included biographical interviews and lesson planning. Informal member checking (Lincoln & Guba, 1985) occurred throughout the seven interviews; a formal member check was conducted as part of the final interview. All interviews were audio-recorded and transcribed. Additional sources of data included observations of methods classes, artifacts from these classes (e.g., syllabi, assignments, exams) and informal interviews with the methods class instructors.

Initial data analysis was done within each individual. Data were chunked into meaningful units; short code words and/or longer comments were added alongside the chunked data in each transcript. After I completed the first pass through the data for one individual, I created summaries of the data which included lists of where to find relevant quotes. As I went through the data for each individual, I kept track of hypotheses, themes and implications of the data.

The final analyses compared individuals and placed them into clusters that were similar along particular dimensions. I worked not only from my summaries of the data, but also returned to the original data sources to confirm that the broader context of the data supported my conclusions, and to reanalyze inconsistent data if it existed. Thus I often reread large sections of the original transcripts to determine whether or not my arguments were empirically defensible. The criterion I used for selecting quotes was whether they were "well-represented"—that is, was the context of the conversation clear, and was the quote consistent with discussions before and after it.

Results and Discussion

The presentation and discussion of the results can be conceptualized as moving through a series of circles whose center is the data itself. Each circle is embedded in a larger circle, but is not necessarily centered within that larger circle as I chose to focus on particular aspects of the data. As I move from the smaller to larger circles, the level of inference goes up. I begin by sticking very close to the data to briefly discuss the participants' conceptions of learning and of the subjects. As I move on to consider some of the ways these conceptions are played out in the participants' lesson planning, I move out to circles of greater diameter in which I may have relevant data from only some of the eight cases, and in which the degree of speculation is higher.

A Preliminary Sketch

Some of the interviews, particularly the early ones, were very unstructured and set the stage by allowing the participants to explore what *they* deemed important. This enabled me to get to know the participants as individuals. Although later interviews tended to be more structured, the tone set in the early interviews remained.

As mentioned earlier, four of the participants taught each subject area during the intensive field experience week. Of those teaching social studies, two were partners: Diane and Meredith. Cindy and Emily also taught social studies, and each had been assigned a partner not participating in this study. There were also two partners in the group of four participants who taught mathematics: Camille and Bryan. Mark was assigned a partner not in this study, and Todd was assigned to work alone.

Despite their similarities in race, age, and social class, the participants were diverse in ways that are not as easily labeled. Meredith, Diane and Mark were each very good students (as measured by their grades); however, my conversations revealed that Meredith and Mark drew heavily on their outside-of-school experiences to interpret their school learning, whereas Diane seemed to lack this kind of integration. Todd and Camille, though describing themselves as

average students, each demonstrated in different ways an intelligence and insight that was not reflected in their grades. Cindy and Emily were also average students, but ones that reminded me that teachers are like the rest of the population, some have a great passion for their profession and others do not. Cindy just did not consider teaching to be as problematic as her professors would have liked her to think; and Emily appeared too tied up with her part-time jobs, and her fixation with the difficulties she had experienced over the years with testing, to really consider the broader issues of teaching. Finally there was Bryan who seemed to approach our discussions about teaching with a naiveté that clearly separated him from the others.

Table 1 supplements this brief introduction by providing three sets of information for each participant. The first column is an attempt to capture in shorthand the salient characteristics of the individuals I came to know. The second and third columns provide a brief synopsis of how the participants' described their mathematics and social studies backgrounds (respectively). Although some data from every participant appears in this article, I will discuss data from only a few of these in greater depth to make certain points.

Conceptions of Mathematics and Social Studies

The participants' conceptions of mathematics and socials studies as domains of knowledge, as school subjects, and as the object of children's learning are an amalgamation of ideas, emotions, beliefs and knowledge that seem to have different weights depending on the circumstances in question. They are not identifiably distinct conceptions that remain stable across contexts. Having said this, it still is worthwhile to tease out and compare these conceptions and their implications.

Conceptions of Learning

Participants' conceptions of how children learn mathematics and social studies came through first in their discussions of their own experiences. *Every participant* spoke of their background in mathematics in terms of either trouble or success in learning the material. Even

Todd, who described himself as an average student who was not particularly concerned with school as a child, distinctly recalled difficulty with long division. In contrast, their discussions of social studies all revolved around affect—in most cases being bored, and in some cases being greatly interested. The only mention of experiences with *learning* social studies was made by Camille who commented that she had problems with American History: "but it was probably because I didn't like memorizing and it was all based on facts" [1:4]. The issue here is not whether these memories are accurate, or even representative, of their experiences, but that these comments speak to the participants' basic perception of what it was like to learn these school subjects, and thus they reveal the frame of mind with which the participants entered the methods courses.

Participants' conceptions of how children learn were connected to their thoughts about natural abilities and what different processes students must go through as they learn these subjects in a classroom setting. For example:

> Math is just more processing than just (...) you know, like I said (...) it's like (...) *Well, some people have math minds* (...) We've known that ... some people are better at it.... Social studies is just more thinking. [Todd, 1:45]

> I think social studies you can kind of just sit and take it in.... and maybe you have to memorize some dates, stuff like that. But with math ... you have to sit ... and figure out solutions to problems. [Diane, 1:11].

Two themes are present here and in other comments related to learning: some people have natural mathematics abilities, and learning mathematics involves a different kind of cognitive "processing" than does social studies. Mark, for example, said that in mathematics there are different kinds of learners: some students need visual representations to help them to understand mathematics and once they understand, memorization follows; other students simply need to practice things over and over again before they "get it." In contrast, Mark said that since everyone can discuss and everyone has feelings, everyone can learn social studies because those two things are the key to social studies. Emily also touched on the notion of different learners and, like Mark, it only seemed to apply to the learning of mathematics. "I guess not all kids are gonna—even if you *try*

manipulatives and—some kids only learn by memorizing facts. *Some kids can't figure out manipulatives"* [1:23, emphasis hers]. She proceeded to cite a peer who stated that the only way he could learn was to memorize it first: "he had to like *memorize the facts, then understand what he was doing*" [1:24, emphasis hers].

In summary, the participants' descriptions of their own experiences learning mathematics were focused on difficulties and successes, whereas in social studies these descriptions focused on affect. Their conceptions of how the general population learns mathematics were filled with ideas of natural ability, and different types of learners, whereas in social studies these ideas were not applicable.

Conceptions of the Subject Areas.

The participants often indicated a change between how they would have defined the subjects before either the methods courses (in the case of social studies) or the content courses (in the case of mathematics), and how they would define them now. In social studies, they moved from an original definition of social studies as history, perhaps with some geography or political science added for good measure, to a very tentative new definition that kept history as its base, but now included a loosely organized set of ideas which emerged from the methods class. Shifts in the definition of mathematics usually involved the addition of problem solving to what was once a very procedural view of mathematics.

The participants found it difficult to compare the subjects. When I first posed the question of comparing social studies and mathematics *as subjects*, Todd said: "*It's hard* (...) it's hard to compare the two in my mind (...) I, I, I don't (...) *compare them at all* (...) I don't see any similarities, to be honest with you" [1:44]. All of the students, including Todd, eventually found some ways to express differences in these subject areas; however, most were unable to directly compare the nature of the subject areas themselves without including comparisons of teaching and

learning of the subjects. One theme that arose among some of the participants was a view of the subject areas as forming a continuum. The basic notion was that on one end of the continuum are the more creative, more interpretive subject areas, whereas on the other end are the more logical, more technical subject areas. On the creative end are subjects like English and art, whereas on the logical end is mathematics. Social studies is situated more toward the creative than the logical. Most participants articulated conceptions of the subjects, or of teaching or learning in these areas, that was consistent with this framework.

Perhaps the most colorful of these distinctions can be found in the following passage in which Bryan was explaining what he meant when he said that mathematics is "technical:"

> If you're in, say art class, and you mix the colors, like red and yellow, you can get orange, but depending on how much red and yellow you use, you can get different variations of orange. But when you add 8 and 2 you're still going to get 10. It's not going to be like a little bit less than ten, a little bit more than 10. That's why I say it's very technical, and very um (...) black and white. [1:9]

Bryan's experience was that assessment in social studies was more flexible, particularly in the case of essay writing, thus teachers could be more creative in dealing with social studies.

Meredith and Todd expressed the differences between the subjects in different ways than the other participants. Meredith considered the dimension of personal value as the major distinguishing feature between the subjects:

> Mathematics is facts yes, (...) and there is always an answer. There's always like (...) there's no like (...) personal feelings to mathematics. You know what I'm saying? You can *love* mathematics, sure (...) but there's no, like, personal value to it. You know.... Personal value isn't like *love* or *trust* or (...) or things like that. You don't feel attacked if somebody says, "Well, I'm sorry but um six plus two is actually eight, not nine." [1:31]

For Todd, the differences were tied to cultural contexts. *"It's not defined as clearly as math* ... With different cultures and stuff (...) social studies would be totally different. In different cultures (...) *math is the same"* [1:45, emphasis his].

Differences between the subjects were also found in implicit and explicit references made about curricular differences between the subject areas. For example, Camille, Todd and Cindy all

discussed mathematics curriculum as being basically predetermined, whereas social studies curriculum clearly allowed one much "more room to expand" (as Camille put it). The comments of other participants were consistent with this view.

Todd and Meredith took this idea further in contemplating how one might want to fill this "room" in the social studies curriculum. They each discussed the problem of determining how to deal with the "ugly" side of "our" history, in terms of quantity and quality, and what effect this would have on the traditional curriculum that focuses more on the "good" parts of history where "we," as the United States citizens, were the heros and explorers. Concerns about the content of the mathematics curriculum were noticeably absent.

In summary, participants saw mathematics as identifiable and definable and saw social studies was more obscure. The participants agreed that there were significant differences between the subjects, but varied in the types of differences discussed. For some students, differences were embedded in assessment. Social studies was considered to be more opinions and values, whereas mathematics had only one answer (although there may be many ways of getting there). For other students differences were captured by the curriculum. Some participants believed mathematics was set and predetermined, whereas social studies had "more room to expand." Questions of content were open in social studies, but settled in mathematics.

Summary of the Dominant Issues

Based on the evidence reviewed in the previous sections, it is reasonable to conclude that the dominant issues for these preservice teachers as they began to seriously consider teaching in these two domains were very different: in mathematics the dominant issue was *How do I get kids to learn mathematics?*; in social studies the dominant issue was *What do I teach kids?* Although not all issues implied by these claims were discussed by all the participants, every participant identified differences between the subject areas that are consistent with them.

Planning to Teach

To this point, the data I have presented have been derived mainly from very general discussions about the participants' conceptions of teaching and learning mathematics and social studies. As the study continued, the objects of the discussion moved from being mostly abstract to being grounded by the context of a variety of planning activities for teaching a particular topic to a particular grade level. There were two general contexts for these discussions of planning: plans designed for implementation in their cooperating teacher's classroom—both one-day lesson plans in each domain as well as full-week lesson plans in only one of these domains; and plans designed solely for me during the "chapter planning interviews" in each of the domains. One word captures much of what I saw in the struggles that these preservice teachers encountered in planning for teaching: control.

The degree to which the teacher (or student) is in control of the teaching (and learning) going on in the classroom is one way of distinguishing different ways of teaching. This control is often evidenced by the degree to which the teacher determines what will be taught, how it will be taught, what questions are asked, what responses are acceptable, and so on. There was variety between participants, and between subject areas, in the ways in which these teachers were willing to relinquish some of that control. In general, the ways in which the participants loosened their control in mathematics was consistent with their focus on issues of student learning, while in social studies it was consistent with their focus on what to teach students, and how to keep their attention. In order to understand these issues more fully, I have chosen to explore one particular case, the case of Todd.

The Case of Todd

Mathematics. Todd felt comfortable in his abilities to do mathematics, but school was never something in which Todd was heavily invested. For his problem solving experience, Todd created an elaborate word problem revolving around the context of planning a trip to Disney World

and figuring out how much money would be needed, and how long it would take to earn it. Although the problem had the potential to allow children to use their understanding of the context to guide their decision making processes, Todd's account of how he implemented these plans painted a picture of a very teacher-directed lesson. Todd set the tone early: "I'm going to read the problem to you. As I read it I need you to follow along ... and start thinking of operations that you need to do to help figure out these problems" [4:2]. After reading the problem, Todd said he directed the groups to: "try to figure out what numbers you need to pull out of the problem" [4:2].

Although Todd asked students to work on the problems in groups, his descriptions of his monitoring techniques and the way he led the whole class discussion afterwards indicated a good deal of teacher control over the way the students went about solving the problem. At first Todd's descriptions of the small group interactions were very general: he spoke about the groups "getting it wrong and getting it wrong" until "finally they figured it out" [4:3]. As I inquired *how* the students knew they were getting it wrong, I began to discover Todd's role in this process. Todd described the ways in which "he helped them out a bit" [4:4] and asked questions like, "Are you sure that's what you're doing?" [4:4], when he saw they were doing something wrong. As Todd went on to describe the whole class discussion that ensued, it suggested that he, as the teacher, had determined the solution process and was going over it by asking specific questions about the steps in *his* solution process.

As the semester continued, Todd was required to do more elaborative planning for our interviews and for the intensive field experience week. Both the chapter planning interview and his intensive week lessons revolved around early work with fractions. Todd's ideas about how to teach in both these planning activities illustrate a conflict between a desire to allow children to explore their own ways of solving problems and a belief that they cannot do "it" without being taught how. This conflict is evidenced by shifts in the degree to which Todd maintained control over students' solution processes, while remaining relatively rigid in his views on assessment and the sequencing of the material.

There were two instances in which Todd spoke of letting the students explore a new concept before "showing" them how to do it. In both cases, Todd clearly did not expect the students to be able to solve the problem, although he quickly added that it would be great if they would. In one instance, Todd was talking about fifth-grade students working on a story problem involving addition or subtraction of fractions with uncommon denominators, and was assuming that he had already introduced them to various representations of fractions. Todd initially spoke about this in a very teacher directed way:

> We would go through it together maybe—pull out the numbers we need or the question in story problems.... you have to look for the keywords ... And *then* I think that we would work on the operations.... But it's something that you have to learn how to do.... This would be traditional teaching. [5:7, emphasis his]

As we talked about this situation in more depth, Todd decided that he could have started out by having them estimate the answer or try to figure it out on their own before he taught them the correct procedure. But when asked what he might expect the students to do on their own, Todd did not really have a response:

> I don't know how to do it that many other ways so that's how I would do it.... I'm not going to tell any kid he's wrong if he comes up with the right answer ... I would teach it the way that I know it.... I would also try and explain to them why it is that way. [5:9]

Later Todd again spoke of allowing the students to work in groups on a problem involving a concept they had not yet dealt with. This time he was able to offer more specific information on his expectations. The students would create "wrong" algorithms because "they don't know any other way to do it" [5:11]. This was viewed by Todd as being good because then the students will "know that that's not going to work" [5:11]. Our conversation then shifted to Todd's expectations for a whole class discussion following this group work.

> It would be nice if some kids could come up with it, or close, or at least get one or two steps right ... but ... it's hard to understand that if you don't really know or *you haven't been shown it before* because it's a different concept. [5:11, emphasis mine]

And so, not only did Todd see the teacher seen as the source of knowledge, but in the case where students might come up with their own methods, he assumed that they would be incorrect algorithms, and not a more conceptually based procedure derived from one or more of the following: their understanding of fractions, their familiarity with fractional representations, the context of the problem itself.

The dominant concern in teaching mathematics that arose out of my analysis of the participants' initial conceptions was *How do I get kids to learn mathematics?* Todd's overriding concern in his lesson planning was making sure that his students learned the material. Given his views of mathematics as well defined and learning mathematics as comprised of mastering teacher-taught procedures, it is not surprising that Todd assumed he needed to be the authority, and therefore resisted relinquishing control. Todd adapted some of the techniques learned in his methods class by exerting more teacher control than intended.

Social Studies. In attempting to discuss both what the day-to-day interactions might look like in his class, as well as what his assessment of social studies might entail, Todd kept coming back to issues of discipline and classroom control. Todd interpreted many of the teaching methods being encouraged in his methods class—like simulations, role playing, and class discussions in which the students ideas are central—as forcing him to lose control.

> Social Studies is like stuff—it would be hard for them to grasp. You know, it's like math—is like—there's answers. There are answers. So they're working towards those answers and I want to see how they got there. But they were doing that.... [In] social studies, I could get them under control, I could get them under control, but then I would be like asking them again like to lose [control] and start thinking about all this stuff. I don't know how I could do that—like discussion-wise. [4:17-18]
>
> ...
>
> With social studies, you know, you want them to think and talk and stuff, so it would be hard to (...) to know when a class had—you know, if they are on task because you don't know what's on their mind. Math you can monitor because they're putting it down on paper.... But in social studies, what you're trying to do—there's really no answers you're looking for. You're trying to make a kid

> more aware of themself—where he comes from and America and everything like that. So that's all in their minds really. [4:19]

Todd's concern about control in his social studies classroom were related to at least two very different issues. One issue was basic discipline. How could he get the average fifth grader (in this case) to care enough about reflecting deeply on the subject matter to attend to the lesson. The other issue concerned dealing with "radical stuff"—whether or not the students could "handle it," the potential for conflict with some students' values, and whether or not he, as teacher, should impose that "ugly" side of society "because there's enough of that ... that they probably get at home" [7:43].

Todd visibly struggled throughout the semester between a number of conflicting beliefs and goals for the classroom. It is interesting to see how these conflicting points of view—particularly the issue of dealing with "radical" or "ugly" history—were dealt with in the context of planning to teach different topics. In the context of the chapter planning interview, Todd paid careful attention to the importance of students' understanding both the Native American's frame of mind and ways of life before the Europeans came, as well as the European's reasons for leaving Europe and their ways of life before they came to the "New World." Todd seemed to be walking a tightrope throughout our discussion, trying to find a way to be "neutral," and wanting his students to do the same. Here is one excerpt of many in which Todd spoke about this:

> I kind of like this[3] a little bit. The Indian view and the European view about why they thought they should take the land—the Europeans and why the Indians, you know—Different viewpoints or different beliefs and values and all of that. It would be a good thing to have children, you know, see both points of view and develop their own, and see who's right or—not even right or wrong but *why*. Because right or wrong, I mean would just be viewed— it's hard to say right or wrong, you know, because if you're Indian, of course, it's wrong to them, but if you're

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3 "This" was one of eight tasks used to promote discussion in one of the chapter planning activities. This particular task asked the question: *During that period of time, who had the right to the land? Explain your reasoning.* (adapted from Beyer, Craven, McFarland & Parker, 1991, p.99) This question was accompanied in the textbook, and in the interview, by two brief excerpts entitled "The Indian View" and "The European View".

> European, what do you do? You're getting—you're trying to escape from Europe and create a new life ... [4:8, emphasis his]

The need to remain neutral seems to emanate from a multitude of sources including his reflection on his own childhood:

> When I was younger, I would take a stance or something just because my dad and my family, you know, were conservative.... You know, I'm not saying that my family is bad or anything, but just within the class you have to worry about where kids come from—their family values and stuff. You have all that stuff which is so ingrained in them that when they come to class it can be a frustrating experience. But I want to just lightly try and have them like just step out of whatever they're in, whatever group they're in, and look at why and how things work. And I think that may cause them to be a more responsible citizen, or grow as a person. [4:15]

During our final interview, I returned to an issue he had brought up much earlier in the semester: how, when, and if "radical material" should be dealt with in the classroom. At this time, Todd reflected on some of the material covered in his methods course and addressed the differences between discussing aspects of Native American history and African American history with school students:

> It's kind of like, *safe* ... to do the American Indians. But that's because there's very few (...) *no matter where you are*.... But when it comes to teaching about Blacks, you know, history or whatever, it's just a *completely different story*. Like when you bring in Martin Luther—well Martin Luther King's safe too because he just preached non-violent, and all that. But what about all—*the much more* amount of Blacks that, you know talked about, violence, and uh (...) Malcolm X and you know, Marcus Garvey.... Those types of views, I mean (...) [it's] *scary to bring those into a classroom*. And they're [author of article for class] talking about like, giving some information like that to just fourth or fifth graders? *I would never do it*.... You can call me whatever you want, but I would never do it. Martin Luther King, yeah, I will do the safe stuff. [7:41-42]

In contrast, during our conversation about the chapter "The Indians of North America," Todd's goal was for his students to:

> Try to get some feel or understand what both sides are doing, not be like pro-European, pro-Indian. Understand both sides, why it happened.... To be able to stand back and see how it happened as opposed to making themselves a part of either group. [4:13]

It seems that when Todd considered dealing with the history of the Native Americans, he could envision part of his goal being to get "them" [his presumably European American students] to see

the perspective of another people at a certain point in time; but when he considered dealing with the history of African Americans, he began to imagine the possibility of having African American students and was concerned about disturbing the racial harmony of his class by discussing certain "radical" information.

I am not implying that Todd's making a distinction between dealing with Native American history and African American history is not understandable, or that it is an unreflective one. As a matter of fact, I considered Todd to have reflected more than any of the other participants on this particular issue. What I do intend to demonstrate is the complicated set of issues and emotions that contribute to the difficulty these preservice teachers faced in their attempts decide what to teach in social studies, a dilemma that did not exist for them in mathematics.

It is important to note that the concerns Todd expressed for teaching social studies were focused on issues of content and teaching style, not issues of student learning. In this way, Todd nicely illustrates that the dominant issue in social studies teaching is one of content, whereas the dominant issue in mathematics is how to get students to learn the material.

Implications

An inescapable implication of this study is that slight improvements in teacher education programs will not be enough to greatly lessen the gap between where these preservice teachers are and where reformers would like them to be. These preservice teachers were involved in a collection of methods courses that promoted reform-minded ways of teaching. In mathematics, the participants also took content courses designed with a similar mindset and, in most cases, taught by mathematics educators involved in the reform. It is reasonable to say that these preservice teachers were educated under relatively good conditions and that they learned quite a bit during their program. However, in the larger scheme of things, what these students have learned are but

the seeds of potential for future change. Thus we are still left with a gap between the dreams for what teacher education should be able to do, and the realities of what it does do.

There is a growing body of literature illustrating the powerful influences that prior experiences on learning to teach. This study not only adds to this literature, but extends it by describing the differential effect that these influences have had on the developing knowledge for teaching mathematics and social studies. Despite efforts by the methods instructors to problematize issues of both learning and content in teaching each of the subjects, the students conceptions lead them to focus mainly on issues of learning in mathematics and issues of content in social studies. It is critical that we, as teachers and teacher educators recognize and appreciate these differences. Perhaps then we can leverage change by dealing directly with issues of control—control over what is taught and how it is learned.

Almost a decade ago, Lampert's (1988) concluded that teacher education cannot improve the quality of (mathematics) teaching alone.

> Even if we were to solve all of the problems with the way teachers are educated that have been identified, we would still need to think about whether the organization of schooling is such that well-educated teachers are able to do the job for which their education prepares them. (p.167-168)

Her comments are no less true today. Beginning teachers are struggling with basic concerns and our system of professional development must accept and take these seriously. In my opinion, taking these seriously includes genuinely questioning what we expect from our elementary school teachers, and, at the very least, building an apprenticeship system into the organization of schooling that allows teachers to focus on issues crucial to the art of teaching. Only by challenging the very enterprise of teaching in elementary schools will we be in a position to take advantage of the growing body of literature on teachers, their practices, and the barriers that inhibit the development of reform-minded instruction.

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Table 1 Highlights of Salient Characteristics and Background Information

NAME	SALIENT CHARACTERISTICS	MATHEMATICS BACKGROUND	SOCIAL STUDIES BACKGROUND
Meredith	intelligent and enthusiastic "I analyze everything"	"highest track" but not overly confident; realized that she often missed the "whys"	great interest and love of this subject; area of concentration;
Diane	"good student" in that she did not seem to question teachers	Good at formulas and structured math, bad at problem solving	couldn't relate to it except when classes included historical fiction (loves English)
Cindy	teaching not very problematic	good at computation, hated word problems; always did well in mathematics classes	used to be bored by it, now interested; area of concentration
Emily	worked 2 jobs; issues of testing came up frequently	good at computation, hated word problems; area of concentration, but has only successfully completed one class thus far	bored K-12, now somewhat interested in recent History
Camille	creative and passionate; questioning career	experiences included some trouble years, and some innovative and interesting years	enjoyed, particularly when done with literature; area of concentration
Bryan	"personable" naive	used to love it, then began having trouble (high school)	not many memories
Todd	average student; worried about becoming "too liberal"	liked it (as much as he liked anything in school) except long division	chose as area of concentration; questioning his values now that in college
Mark	loves analogies self-assured	favorite subject and area of concentration; family members in business field	least favorite subject; bored K-12, more interested now

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